

WE CLAIM:

1. A protein derived from an enterically transmitted non-A/non-B viral hepatitis agent whose genome contains a region which is homologous to a coding region of the 1.33 kb DNA EcoRI insert present in plasmid pTZKF1(ET1.1) carried in E. coli strain BB4 and having ATCC deposit no. 67717.

2. The protein of claim 1, which is encoded by a complete coding region within said 1.33 kb EcoRI insert.

3. A recombinant protein derived from an enterically transmitted nonA/nonB viral hepatitis agent whose genome contains a region which is homologous to a coding region of a DNA molecule having a first sequence (SEQ ID NO.1):

AGACCTGTCC CTGTTGCAGC TTTCTACCA CCTGCCCCG AGCTCGAACA GGGCCTTCTC 60  
TACCTGCCCC AGGAGCTCAC CACCTGTGAT AGTGTCTGTA CATTGAATT AACAGACATT 120  
GTGCACTGCC GCATGCCCGC CCCGAGCCAG CCAAGGCCG TGCTGTCCAC ACTCGTGGG 180  
CGCTACGGCG GTCGACAAA GCTCTACAAT GCTTCCGACT CTGATGTTTC GACTCTCTC 240  
GCCCCGTTTA TCCCGCCAT TGGCCCCGTA CAGGTTACAA CTTGTGAATT GTACGAGCTA 300  
GTGGAGGCCA TGGTCGAGAA GGGCCAGGAT GGCTCCGCCG TCCTTGAGCT TGATCTTTGC 360  
AACCGTGACG TGTCAGGAT CACCTTCTTC GAGAAAGATT GTAACAAGTT CACCACAGGT 420  
GAGACCATTG CCCATGTTAA AGTGGGCCAG GGCATCTCGG CCTGGAGCAA GACCTTCTGC 480  
GCCCTCTTTC GCCCTTGGT CCGCGCTATT GAGAAGGCTA TTCTGGCCCT GCTCCCTCAG 540  
GGTGTGTTTT ACGGTGATGC CTTTGATGAC ACCGTCTTCT CGGCGGCTGT GGCCGCAGCA 600  
AAGGCATCCA TGGTGTGTTGA GAATGACTTT TCTGAGTTTG ACTCCACCCA GAATAACTTT 660  
TCTCTGGGTC TAGAGTGTGC TATTATGGAG GAGTGTGGGA TGCCGCAGTG GCTCATCCGC 720  
CTGTATCACC TTATAAGGTC TCGTGGATC TTGCAGGCCG CGAAGGAGTC TCTGCGAGGG 780  
TTTTGAAGA AACACTCCGG TGAGCCCGGC ACTCTTCTAT GGAATACTGT CTGGAATATG 840  
GCCGTTATTA CCCACTGTGA TGACTTCCGC GATTTTCAGG TGCTGCCTT TAAAGGTGAT 900

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5 GATTGATAG TGTTTGCAG TGAGTATCGT CAGAGTCCAG GAGCTGCTGT CCTGATCGCC 960  
GGCTGTGGCT TGAAGTTGAA GGTAGATTC CGCCCGATCG GTTGTATGC AGGTGTTGTG 1020  
GTGGCCCCCG GCCTTGCGC GCTCCCTGAT GTTGTGCGT TCGCCGGCCG GCTTACCGAG 1080  
AAGAATTGGG GCCCTGGCCC TGAGCGGGCG GAGCAGCTCC GCCTCGCTGT TAGTGATTTT 1140  
10 CTCCGCAAGC TCACGAATGT AGCTCAGATG TGTGTGGATG TTGTTTCCCG TGTATGTTGG 1200  
GTTTCCCCTG GACTCGTTCA TAACCTGATT GGCATGCTAC AGGCTGTTGC TGATGGCAAG 1260  
GCACATTTCA CTGAGTCAGT AAAACCAGTG CTCGA 1295

a second sequence (SEQ ID NO.5):

TCGAGCACTG GTTTTACTGA CTCAGTGAAA TGTGCCTTGC CATCAGCAAC AGCCTGTAGC 60  
ATGCCAATCA GGTATGAAC GAGTCCAGGG GAAACCCCAT AAACACGGGA AACAACATCC 120  
20 ACACACATCT GAGCTACATT CGTGAGCTTG CGGAGGAAAT CACTAACAGC GAGGCGGAGC 180  
TGCTCCGCC GCTCAGGGCC AGGGCCCAA TTCTTCTCGG TAAGCCGGCC GGCGAAGCGC 240  
25 ACAACATCAG GGAGCGCGCC AAGGCCGGG GCCACGACAA CACCTGCATA CAAACCGATC 300  
GGGCGGAAAT CTACCTTCAA CTCAAGCCA CAGCCGGCGA TCAGGACAGC AGCTCCTGGA 360  
CTCTGACGAT ACTCACTGCA AAGCACTATC GAATCATCAC CTTTAAAGGC AGCCACCTGA 420  
30 AAATCGCGGA AGTCATAACA GTGGGTAATA ACGGCCATAT TCCAGACAGT ATTCCATAGA 480  
AGAGTGCCGG GCTCACCGBA GTGTTTCTTC CAAAACCCTC GCAGAGACTC TTTCGGGGCC 540  
35 TGCAAGATCC ACGCAGACCT TATAAGGTGA TACAGGCGGA TGAGCCACTG CGGCATCCCA 600  
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TCAGAAAAGT CATTCTCAA CACCATGGAT GCCTTTGCTG CGGCCACAGC CGCCGAGAAG 720  
40 ACGGTGTCAT CAAAGGCATC ACGGTAAAC ACAACCTGAG GGAGCAGGGC CAGAATAGCC 780  
TTCTCAATAG CGCGGAACCA AGGCCAAAG AGGGCGCAGA AGGTCTTGCT CCAGGCCGAG 840  
45 ATGCCCTGGC CCACTTTACC ATGGGCAATG GTCTACCTG TGGTGAACCT GTTACAATCT 900  
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50 ACCTGTACGG GGCCAATGGC CGGGATAAAA CGGGCGAGAG AGTCGCGAAC ATCAGAGTGG 1080  
GAAGCATTGT AGAGCTTTGT GCGACCGCCG TAGCGGCCCA CGAGTGTGGA CAGCACGGCC 1140  
55 TTGCGCTGGC TCGGGGCGGC CATGCGGCAG TGCACAATGT CTGTTAATTC AAATGTTACG 1200

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ACACTATCAC AGGTGGTGAG CTCCTGGGGC AGGTAGAGAA GGCCCTGTTC GAGCTCGGGG 1260  
CAGGGTGGTA GAACAGCTGC AACAGGGACA GGTCT 1295

5 a third sequence (SEQ ID NO.6):  
AGGCAGACCA CATATGTGGT CGATGCC ATGGAGGCC ATCAGTTTAT TAAGGCTCCT 57  
GGCATCACTA CTGCTATTGA GCAGGCTGCT CTAGCAGCGG CCAACTCTGC CCTGGCGAAT 117

10 GCTGTGGTAG TTAGGCCCTT TCTCTCTCAC CAGCAGATTG AGATCCTCAT TAACCTAATG 177  
CAACCTCGCC AGCTTGTTTT CCGCCCCGAG GTTTTCTGGA ATCATCCCAT CCAGCGTGTC 237  
ATCCATAACG AGCTGGAGCT TTAAGTCCGC GCCCGCTCCG GCCGCTGTCT TGAAATTGGC 297

15 GCCCATCCCC GCTCAATAAA TGATAATCCT AATGTGGTCC ACCGCTGCTT CCTCCGCCCT 357  
GTTGGGCGTG ATGTTGACCG CTGGTATACT GCTCCCACTC GCGGGCCGGC TGCTAATTGC 417

20 CGGCGTTCCG CGCTGCGCGG GCTTCCCGGT GCTGACCGCA CTTACTGCCT CGACGGGTTT 477  
TCTGGCTGTA ACTTTCCCGC CGAGACTGGC ATCGCCCTCT ACTCCCTTCA TGATATGTCA 537  
CCATCTGATG TCGCCGAGGC CATGTTCCGC CATGGTATGA CGCGGCTCTA TGCCGCCCTC 597

25 CATCTTCCGC CTGAGGTCTT GCTGCCCCCT GGCACATATC GCACCGCATC GTATTTGCTA 657  
ATTCATGACG GTAGGCGCGT TGTGGTGACG TATGAGGGTG AACTAGTGC TGGTTACAAC 717

30 CACGATGTCT CCAACTTGGC CTCCTGGATT AGAACCACCA AGGTTACCGG AGACCATCCC 777  
CTCGTTATCG AGCGGGTTAG GGCCATTGGC TGCCACTTTG TTCTCTTGCT CACGGCAGCC 837  
CCGGAGCCAT CACCTATGCC TTATGTCCCT TACCCCGGT CTACCGAGGT CTATGTCCGA 897

35 TCGATCTTCG GCCCGGTGG CACCCTTCC TTATCCCAA CCTCATGCTC CACTAAGTCG 957  
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40 GATGACCAAG CCTTTTGCTG CTCCCGTTTA ATGACCTACC TTCGCGGCAT TAGCTACAAG 1077  
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45 ATATCCAAGG GGATGCGTCG TCTGGAACGG GAGCATGCC AGAAGTTTAT AACACGCCTC 1257  
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50 TACGCCAGT GCAGGCGCTG GCTCTCCGCC GGTTTCATC TTGATCCACG GGTGTTGGTT 1377  
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55 GCCGTGCGCG ACCAGGGTCA TGATAATGAA GCCTATGAGG GGTCCGATGT TGACCCTGCT 1557

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5 TTGACGGTCG CCCCTCTCC ACCATCCAGC AGTACTCGAA GACCTTCTTT GTCCTGCCGC 6767  
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10 ATAACACCAC TGCTAGCGAC CAACTGCTTG TCGAGAATGC CGCCGGGCAC CGGGTCGCTA 6887  
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15 ATACTTTTGA TGATTCTGCG CCAGAGTGCC GCCCCCTTGG CCTTCAGGGC TCGCCTTTCC 7067  
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20 AG TTTATTGCT TGTGCCCGC TTCTTCTGT TGCTTATTC TCATTCTGC 7179  
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a fourth sequence (SEQ ID NO.10):  
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30 GAGGTTTTTT GGAATCACCG GATTCAACGT GTTATACATA ATGAGCTTGA GCAGTATTGC 240  
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35 CCTAATGTCC TCCATCGCTG GTTCTCCAC CCGTCGGCC GGGATGTTC GCGCTGGTAC 360  
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50 GGCTGTCACT TTGTGTTGTT GATCACTGCG GCCCCTGAGC CTTCCCGAT GCCCTACGTT 840  
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55 TCGCTGTTCC CGACCGCTTG TGCTGTCAAG TCCACTTTTC ACGCCGTCCC CACGCACATC 960

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5	GAAGGCTGGA ATGCCACCGA GGATGCGCTC ACTGCAGTTA TTACGGCGGC TTACCTCACA	1140
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15	CGAACCACCA TCCGGCGGAT CGCTGAAAAA TTTTGCTGTT TTATGAAGTG GCTCGGTCAG	1440
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20	TCATACATCG TGGATGGTCG GTCTCTGCAA ACTGTCTATC AAGCTCTCGA CCTGCCAGCT	1620
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25	CGTCTGGATT GCCAAACAAT GATCGGCAAT AAGACTTTTC TCACTACCTT TGTGATGGG	1740
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30	AGTATGGCAG CCGGCCCGTT TTGCCTCACC TATGCTGCCG TAGATGGCGG GCTGGAAGTT	1860
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35	CAGCGCCAGT CGGTTATTGG TAGTTTGTGG CTGCACCCTG AAGGTTTGCT CCGGCTGTTC	2040
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40	GGTCATTGAG ATGCTGCTCC CCACTCGGGG GGGCCACCTG CTAAGTCCAC AGGCCCTGCT	2220
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45	CCCTCTGGGG CCCGTCCGGC TGGCCCCAAC CCGAATGGCG TTCCGCAGCG CCGCTTACTA	2340
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50	TTTCAGCGTT ACCCTGATTC GTTTGACGCC ACCAAGTTTG TGATGCGTGA TGGTCTTGCC	2520
	GCGTATACCC TTACACCCCG GCCGATCATT CATGCGGTGG CCCCAGGACTA TCGATTGGAA	2580
55	CATAACCCCA AGAGGCTCGA GGCTGCCTAC CGCGAGACTT GCGCCCGCCG AGGCACTGCT	2640



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10 TCAAAGTCGG TGCAACAGGC GGATGTGGAT GTTGTGTTG TGCCCACTCG CGAGCTTCGG 3000  
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40 AGTGTGTGA CATTTGAGCT AACTGACATT GTGCACTGCC GCATGGCGGC CCCTAGCCAA 3900  
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45 GCGGGTCACA CCGATGTCCG CGCCTCCCTT GCGCGCTTTA TTCCCACTCT CGGGCGGGTT 4020  
ACTGCCACCA CCTGTGA ACTTTGAGCTT GTAGAGGCGA TGGTGGAGAA GGGCCAAGAC 4080  
GGTTCAGCCG TCCTCGAGTT GGATTTGTGC AGCCGAGATG TCTCCGCAT AACCTTTTTT 4140  
50 CAGAAGGATT GTAACAAGTT CACGACCGC GAGACAATTG CGCATGGCAA AGTCGGTCAG 4200  
GGTATCTTCC GCTGGAGTAA GACGTTTTGT GCCCTGTTG GCCCCTGGT CCGTGCGATT 4260  
55 GAGAAGGCTA TTCTATCCCT TTTACCACAA GCTGTGTTCT ACGGGGATGC TTATGACGAC 4320

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TCAGTATTCT CTGCTGCCGT GGCTGGCGCC AGCCATGCCA TGGTGTGGA AAATGATTTT 4380  
TCTGAGTTTG ACTCGACTCA GAATACTTT TCCCTAGGTC TTGAGTGC GC CATTATGGAA 4440  
5 GAGTGTGGTA TGCCCCAGTG GCTTGTGAGG TTGTACCATG CCGTCCGGTC GGCCTGGATC 4500  
CTGCAGGCCC CAAAAGAGTC TTTGAGAGGG TTCTGGAAGA AGCATTCTGG TGAGCCGGGC 4560  
AGCTTGCTCT GGAATACGGT GTGGAACATG GCAATCATTG CCCATTGCTA TGAGTTCCGG 4620  
10 GACCTCCAGG TTGCCGCTT CAAGGGCGAC GACTCGGTGC TCCTCTGTAG TGAATACCGC 4680  
CAGAGCCCAG GCGCCGGTTC GCTTATAGCA GGCTGTGGTT TGAAGTTGAA GGCTGACTTC 4740  
15 CGGCCGATTG GGCTGTATGC CGGGTGTGTC GTCGCCCCGG GGCTCGGGGC CCTACCCGAT 4800  
GTCGTTGAT TCGCCGACG GCTTTCGGAG AAGAACTGGG GGCCTGATCC GGAGCGGGCA 4860  
GAGCAGCTCC GCCTCGCCGT GCAGGATTTC CTCCGTAGGT TAACGAATGT GGCCAGATT 4920  
20 TGTGTTGAGG TGGTGTCTAG AGTTACGGG GTTTCCTCCGG GTCTGGTTCA TAACCTGATA 4980  
GGCATGCTCC AGACTATTGG TGATGTAAG GCGCATTTTA CAGAGTCTGT TAAGCCTATA 5040  
25 CTTGACCTTA CACACTCAAT TATGACCGG TCTGAATGAA TAACATGTGG TTGCTGCGC 5100  
CCATGGGTTT GCCACCATGC GCCCTAGGCC TTTTGTGTG TTGTTCTCT TGTTCCTGCC 5160  
TATGTTGCCC GCGCCACCGA CCGGTGAGG GTCTGGCCGC CGTGTGGGC GCGCAGCGG 5220  
30 CGGTACCGGC GGTGGTCTT GGGGTGACG GGTGATTCT CAGCCCTTCG CAATCCCTA 5280  
TATTCATCCA ACCAACCCCT TTGCCCCAGA CGTTGCCGCT GCGTCCGGT CTGGACCTCG 5340  
35 CCTTCGCCAA CCAGCCCGG CACTTGCTC CACTTGCGA GATCAGGCC AGCGCCCTC 5400  
CGCTGCCTCC CGTCGCCGAC CTGCCACAGC CGGGCTGCG GCGCTGACGG CTGTGGCGCC 5460  
TGCCCATGAC ACCTCACCG TCCCGACGT TGATTCTCG GGTGCAATTC TACGCCGCA 5520  
40 GTATAATTG TCTACTCAC CCCTGACATC CTCTGTGGC TCTGGCACTA ATTTAGTCCT 5580  
GTATGCAGCC CCCCTTAATC CGCTCTGCC GCTGCAGGAC GGTACTAATA CTCACATTAT 5640  
45 GGCCACAGAG GCCTCCAATT ATGCACAGTA CCGGGTTGCC GCGCTACTA TCCGTTACCG 5700  
GCCCTAGTG CCTAATGCAG TTGAGGCTA TGCTATATCC ATTTCTTTCT GGCCTCAAAC 5760  
AACCACAACC CCTACATCTG TTGACATGAA TTCCATTACT TCCACTGATG TCAGGATTCT 5820  
50 TGTTCACCT GGCATAGCAT CTGAATTGGT CATCCCAAGC GAGCGCCTTC ACTACCGCAA 5880  
TCAAGGTTGG CGCTCGGTG AGACATCTGG TGTGCTGAG GAGGAAGCCA CCTCCGGTCT 5940  
55 TGTCATGTTA TGCATACATG GCTCTCCAGT TAACTCCTAT ACCAATACCC CTTATACCGG 6000

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5 TGCCCTTGGC T TACTGGACT TTGCCTTAGA GCTTGAGTTT CGCAATCTCA CCACCTGTAA 6060  
CACCAATACA CGTGTGTCCC GTTACTCCAG CACTGCTCGT CACTCCGCCC GAGGGGCCGA 6120  
CGGGACTGCG GAGCTGACCA CAACTGCAGC CACCAGGTTC ATGAAAGATC TCCACTTTAC 6180  
CGGCCTTAAT GGGGTAGGTG AAGTCGGCCG CGGGATAGCT CTAACATTAC TTAACCTTGC 6240  
TGACACGCTC CTCGGCGGGC TCCCACAGA ATTAATTTCTG TCGGCTGGCG GGCAACTGTT 6300  
10 TTATTCCCGC CCGGTTGTCT CAGCCAATGG CGAGCCAACC GTGAAGCTCT ATACATCAGT 6360  
GGAGAATGCT CAGCAGGATA AGGGTGTTC TATCCCCAC GATATCGATC TTGGTGATTC 6420  
GCGTGTGGTC ATTCAGGATT ATGACAACCA GCATGAGCAG GATCGGCCA CCCCCTCGCC 6480  
TGCGCCATCT CGGCCTTTT CTGTTCTCG AGCAAATGAT GTACTTTGGC TGTCCCTCAC 6540  
TGCAGCCGAG TAAGACCAGT CCACTTACGG GTCGTCAACT GGCCCGGTTT ATATCTCGGA 6600  
20 CAGCGTGACT TTGGTGAATG TTGCGACTGG CGCGCAGGCC GTAGCCCGAT CGCTTGACTG 6660  
GTCCAAAGTC ACCCTCGACG GCGGCCCCCT CCCGACTGTT GAGCAATATT CCAAGACATT 6720  
CTTTGTGCTC CCCCTTCGTG GCAAGCTCTC CTTTGGGAG GCCGGCACA CAAAAGCAGG 6780  
TTATCCTTAT AATTATAATA CTAATGCTAG TGACCAGATT CTGATTGAAA ATGCTGCCGG 6840  
CCATCGGGTC GCCATTTCAA CCTATACCAC CAGGCTTGGG GCCGGTCCGG TCGCCATTTT 6900  
30 TCGGCCCGCG GTTTTGGCTC CACGCTCCGC CCTGGCTCTG CTGGAGGATA CTTTGTATTA 6960  
TCCGGGGCGG GCGCACACAT TTGATGACTT CTGCCCTGAA TGCCGCGCTT TAGGCTCCA 7020  
GGGTTGTGCT TTCCAGTCAA CTGTCGCTGA GCTCCAGCGC CTAAAGTTA AGGTGGGTAA 7080  
35 AACTCGGGAG TTGTAGTTTA TTTGGCTGTG CCCACCTACT TATATCTGCT GATTCCTTT 7140  
ATTCCTTTT TCTCGGTCCC GCGCTCCCTG A 7171  
40

or a fifth sequence (SEQ ID NO.12):

CGGGCCCCGT ACAGGTCACA ACCTGTGAGT GTACGAGCT AGTGAGGCC ATGGTCGAGA 60  
AAGGCCAGGA TGGCTCCGCC GTCCTTGAGC TCGATCTCTG CAACCGTGAC GTGTCCAGGA 120  
45 TCACCTTTTT CCAGAAAGAT TGCAATAAGT TCACCACGGG AGAGACCATC GCCCATGGTA 180  
AAGTGGCCA GGGCATTTCG GCCTGGAGTA AGACCTTCTG TGCCCTTTTC GGCCCTGGT 240  
50 TCCGTGCTAT TGAGAAGGCT ATTCTGGCCC TGCTCCCTCA GGGTGTGTTT TATGGGGATG 300  
CCTTTGATGA CACCGTCTTC TCGGCGGTG TGGCCGAGC AAAGGCGTCC ATGGTGTGTTG 360  
AGAATGACTT TTCTGAGTTT GACTCCACCC AGAATAATTT TTCCCTGGGC CTAGAGTGTG 420  
55 CTATTATGGA GAAGTGTGGG ATGCCGAAGT GGCTCATCCG CTTGTACCAC CTTATAAGGT 480

CTGCGTGGAT CCTGCAGGCC CCGAAGGAGT CCCTGCGAGG GTGTTGGAAG AAACACTCCG 540  
 GTGAGCCCCG CACTCTTCTA TGAATACTG TCTGGAACAT GGCCGTTATC ACCCATTGTT 600  
 5 ACGATTTCG CGATTTCGAG GTGGCTGCCT TTAAAGGTGA TGATTCGATA GTGCTTTGCA 660  
 GTGAGTACCG TCAGAGTCCA GGGGCTGCTG TCCTGATTGC TGGCTGTGGC TTAAAGCTGA 720  
 10 AGGTGGGTTT CCGTCCGATT GGTGTGTATG CAGGTGTTGT GGTGACCCCC GGCCTTGGCG 780  
 CGCTTCCCGA CGTCGTGCGC TTGTCCGGCC GGCTTACTGA GAAGAATTGG GGCCTTGGCC 840  
 CTGAGCGGGC GGAGCACTC CGCCTTGCTG TGC 874

15  
 or a sequence complementary thereto.

20 4. A protein which is (a) immunoreactive with antibodies present in individuals infected with enterically transmitted nonA/nonB hepatitis and (b) derived from a viral hepatitis agent whose genome contains a region which is homologous to the 1.33 kb DNA EcoRI insert present in plasmid pTZXF1(ET1.1) carried in E. coli strain BB4, and having ATCC  
 25 Deposit Nno. 67717.

5. The protein of claim 4, which is encoded by a coding region within said 1.33 kb EcoRI insert.

30 6. A protein which is (a) immunoreactive with antibodies present in individuals infected with enterically transmitted nonA/nonB hepatitis and (b) encoded by genetic sequence 406.3-2 or 406.4-2 or a fragment thereof.

35 7. A method of detecting infection by enterically transmitted nonA/nonB hepatitis viral agent in a test individual, comprising:  
 providing a peptide antigen which is (a)  
 40 immunoreactive with antibodies present in individuals infected with enterically transmitted nonA/nonB hepatitis and (b) derived from a viral hepatitis agent whose genome contains a region which is homologous to

the 1.33 kb DNA EcoRI insert present in plasmid  
pTZKF1(ET1.1) carried in E. coli strain BB4, and  
having ATCC deposit no. 67717,

5        reacting serum from the test individual with  
such antigen, and  
         examining the antigen for the presence of  
bound antibody.

10       8. The method of claim 7, wherein the serum  
antibody is an IgM or IgG antibody, or a mixture of  
both, the antigen provided is attached to a support,  
said reacting includes contacting such serum with the  
support and said examining includes reacting the  
15       support and bound serum antibody with a reporter-  
labeled anti-human antibody.

20       9. A kit for ascertaining the presence of serum  
antibodies which are diagnostic of enterically  
transmitted nonA/nonB hepatitis infection, comprising  
a support with surface-bound recombinant  
peptide antigen which is (a) immunoreactive with  
antibodies present in individuals infected with  
enterically transmitted nonA/nonB viral hepatitis  
agent and (b) derived from a viral hepatitis agent  
25       whose genome contains a region which is homologous to  
the 1.33 kb DNA EcoRI insert present in plasmid  
pTZKF1(ET1.1) carried in E. coli strain BB4, and  
having ATCC deposit no. 67717, and  
         a reporter-labeled anti-human antibody.

30       10. A DNA fragment derived from an enterically  
transmitted nonA/nonB viral hepatitis agent whose  
genome contains a region which is homologous to the  
1.33 kb DNA EcoRI insert present in plasmid  
35       pTZKF1(ET1.1) carried in E. coli strain BB4 and having  
ATCC deposit no. 67717.

11. The fragment of claim 10, which is derived from said 1.33 kb EcoRI insert.

12. A DNA molecule comprising genetic sequence 406.3-2 or 406.4-2 or a fragment thereof, wherein said fragment comprises at least 12 consecutive nucleotides.

13. A DNA fragment derived from an enterically transmitted nonA/nonB viral hepatitis agent whose genome contains a region which is homologous to a DNA fragment within a first sequence (SEQ ID NO.1):

AGACCTGTCC CTGTTGCAGC TGTCTACCA CCCTGCCCCG AGCTCGAACA GGGCCTTCTC 60  
TACCTGCCCC AGGAGCTCAC CACCTGTGAT AGTGTCGTAA CATTTGAATT AACAGACATT 120  
GTGCACTGCC GCATGGCCGC CCCGAGCCAG CGCAAGGCCG TGCTGTCCAC ACTCGTGGGC 180  
CGCTACGGCG GTCGCACAAA GCTCTACAAT GCTTCCCACT CTGATGTTTG CGACTCTCTC 240  
GCCCGTTTTA TCCCGGCCAT TGGCCCGTA CAGGTTACAA CTTGTGAATT GTACGAGCTA 300  
GTGGAGGCCA TGGTCGAGAA GGGCCAGGAT GGCTCCGCCG TCCTGAGCT TGATCTTTGC 360  
AACCGTGACG TGTCCAGGAT CACCTTCTTC CAGAAAGATT GTAACAAGTT CACCACAGGT 420  
GAGACCATTG CCCATGGTAA AGTGGGCAG GGCATCTCGG CCTGGAGCAA GACCTTCTGC 480  
GCCCTCTTTG GCCCTTGGTT CCGCGCTATT GAGAAGGCTA TTCTGGCCCT GCTCCCTCAG 540  
GGTGTGTTTT ACGGTGATGC CTTTGATGAC ACCGTCTTCT CGGCGGCTGT GGCCGCAGCA 600  
AAGGCATCCA TGGTGTGTTGA GAATGACTTT TCTGAGTTTG ACTCCACCCA GAATACTTT 660  
TCTCTGGGTC TAGAGTGTGC TATTATGGAG GAGTGTGGGA TGCCGCAGTG GCTCATCCGC 720  
CTGTATCACC TTATAAGGTC TGCCTGGATC TTGCAGGCCG CGAAGGAGTC TCTGCGAGGG 780  
TTTTGGAAGA AACACTCCGG TGAGCCCGGC ACTCTTCTAT GGAATACTGT CTGGAATATG 840  
GCCGTTATTA CCCACTGTGA TGACTTCCGC GATTTTCAGG TGGCTGCCTT TAAAGGTGAT 900  
GATTCGATAG TGCTTTGCAG TGAGTATCGT CAGAGTCCAG GAGCTGCTGT CCTGATCGCC 960  
GGCTGTGGCT TGAAGTTGAA GGTAGATTTC CGCCCGATCG GTTTGTATGC AGGTGTTGTG 1020  
GTGGCCCCCG GCCTTGCGC GCTCCCTGAT GTTGTGCGCT TCGCCGGCCG GCTTACCGAG 1080  
AAGAATTGGG GCCCTGGCCC TGAGCGGGCG GAGCAGCTCC GCCTGCTGT TAGTGATTTT 1140

CTCCGCAAGC TCACGAATGT AGCTCAGATG TGTGTGGATG TTGTTTCCCG TGTTTATGGG 1200  
 GTTTCCTG GACTCGTTCA TAACCTGATT GGCATGCTAC AGGCTGTTGC TGATGGCAAG 1260  
 5 GCACATTTCA CTGAGTCAGT AAAACCAGTG CTCGA 1295

a second sequence (SEQ ID NO.5):

TCGAGCACTG GTTTTACTGA CTCAGTGAAA TGTGCCTTGC CATCAGCAAC AGCCTGTAGC 60  
 10 ATGCCAATCA GGTATGAAC GAGTCCAGGG GAAACCCCAT AAACACGGGA AACAACATCC 120  
 ACACACATCT GAGCTACATT CGTGAGCTTG CGGAGGAAAT CACTAACAGC GAGGCGGAGC 180  
 TGCTCCGCCC GCTCAGGGCC AGGGCCCCAA TTCTTCTCGG TAAGCCGGCC GGCGAAGCGC 240  
 15 ACAACATCAG GGAGCGCGCC AAGGCCGGGG GCCACCACAA CACCTGCATA CAAACCGATC 300  
 GGGCGGAAAT CTACCTTCAA CTTOAAGCCA CAGCCGGCGA TCAGGACAGC AGCTCCTGGA 360  
 20 CTCTGACGAT ACTCACTGCA AAGCACTATC GAATCATCAC CTTTAAAGGC AGCCACCTGA 420  
 AAATCGCGGA AGTCATAACA GTGGTAATA ACGGCCATAT TCCAGACAGT ATTCCATAGA 480  
 AGAGTGCCGG GCTCACCGBA GTGTTTCTC CAAAACCTC GCAGAGACTC CTTGCGGGCC 540  
 25 TGCAAGATCC ACGCAGACCT TATAAGGTGA TACAGGCGGA TGAGCCACTG CGGCATCCCA 600  
 CACTCCTCCA TAATAGCACA CTCTAGACCC AGAGAAAAGT TATTCTGGGT GGAGTCAAAC 660  
 30 TCAGAAAAGT CATTCTCAA GACCATGGAT GCCTTTGCTG CGGCCACAGC CGCCGAGAAG 720  
 ACGGTGTCAT CAAAGGCATC ACCGTAAAAC ACACCCTGAG GGAGCAGGGC CAGAATAGCC 780  
 TTCTCAATAG CGCGGAACCA AGGGCCAAAG AGGGCGCAGA AGGTCTTGCT CCAGGCCGAG 840  
 35 ATGCCCTGGC CCACTTTACC ATGGCAATG GTCTCACCTG TGGTGAAGTT GTTACAATCT 900  
 TTCTGGAAGA AGGTGATCCT GCACACGTCA CGGTTGCAA GATCAAGCTC AAGGACGGCG 960  
 40 GAGCCATCCT GGCCCTTCTC GACCATGGCC TCCACTAGCT CGTACAATTC ACAAGTTGTA 1020  
 ACCTGTACGG GGCCAATGGC CGGATAAAA CGGGCGAGAG AGTCGGAAC ATCAGAGTGG 1080  
 GAAGCATTGT AGAGCTTTGT GCGACCGCCG TAGCGGCCA CGAGTGTTGA CAGCACGGCC 1140  
 45 TTGCGCTGGC TCGGGCGGC CATGCGGCAG TGCACAATGT CTGTTAATTC AAATGTTACG 1200  
 ACACTATCAC AGGTGGTGAG CTCCTGGGGC AGGTAGAGAA GGCCCTGTTG GAGCTCGGGG 1260  
 50 CAGGGTGGA GAACAGCTGC AACAGGGACA GGTCT 1295

a third sequence (SEQ ID NO.6):

AGGCAGACCA CATATGTGGT CGATGCC ATGGAGGCC ATCAGTTTAT TAAGGCTCCT 57  
 55 GGCATCACTA CTGCTATTGA GCAGGCTGCT CTAGCAGCGG CCAACTCTGC CCTGGCGAAT 117

	GCTGTGGTAG TTAGGCCTTT TCTCTCTCAC CAGCAGATTG AGATCCTCAT TAACCTAATG	177
	CAACCTCGCC AGCTTGTTTT CCGCCCCGAG GTTTTCTGGA ATCATCCCAT CCAGCGTGTC	237
5	ATCCATAACG AGCTGGAGCT TTAGTGCCGC GCCCGCTCCG GCCGCTGTCT TGAAATTGGC	297
	GCCCATCCCC GCTCAATAAA TGATAATCCT AATGTGGTCC ACCGCTGCTT CCTCCGCCCT	357
10	GTTGGGCGTG ATGTTACAGC CTGGTATACT GCTCCCACTC GCGGGCCGGC TGCTAATTGC	417
	CGGCGTTCCG CGCTGCGCGG GCTTCCCGCT GCTGACCGCA CTTACTGCCT CGACGGGTTT	477
	TCTGGCTGTA ACTTTCCCGC CGAGACTGGC ATCGCCCTCT ACTCCCTTCA TGATATGTCA	537
15	CCATCTGATG TCGCCGAGGC CATGTTCCGC CATGGTATGA CGCGGCTCTA TGCCGCCCTC	597
	CATCTTCCGC CTGAGGTCCT GCTGCCCCCT GGCACATATC GCACCGCATC GTATTTGCTA	657
20	ATTCATGACG GTAGGCGCGT TGTGGTGACG TATGAGGGTG AACTAGTGC TGTTTACAAC	717
	CACGATGTCT CCAACTTGCG CTCCTGGATT AGAACCACCA AGGTTACCGG AGACCATCCC	777
	CTCGTTATCG AGCGGGTTAG GGCCATTGGC TGCCACTTTG TTCTTTGCT CACGGCAGCC	837
25	CCGGAGCCAT CACCTATGCC TTATGTTTCT TACCCCGGT CTACCGAGGT CTATGTCCGA	897
	TCGATCTTCG GCCCGGGTGG CACCCCTTCC TTATTCCCAA CTCATGCTC CACTAAGTCG	957
30	ACCTTCCATG CTGTCCCTGC CCATATTTGG GACCGTCTTA TGCTGTTCCG GGCCACCTTG	1017
	GATGACCAAG CCTTTTGCTG CTCCTGTTTA ATGACCTACC TTCGCGGCAT TAGCTACAAG	1077
	GTCAGTGTG GTACCCTTGT GGCTAATGAA GGCTGGAATG CCTCTGAGGA CGCCCTCACA	1137
35	GCTGTTATCA CTGCCGCTA CCTTACCATT TGCCACCAGC GGTATCTCCG CACCCAGGCT	1197
	ATATCCAAGG GGATGCGTCG TCTGGAACGG GAGCATGCCC AGAAGTTTAT AACACGCCTC	1257
40	TACAGCTGGC TCTTCGAGAA GTCCGGCCGT GATTACATCC CTGGCCGTCA GTTGGAGTTC	1317
	TACGCCCAGT GCAGGCGCTG GCTCTCCGCC GGCTTTTATC TTGATCCACG GGTGTTGGTT	1377
	TTTGACGAGT CGGCCCCCTG CCATTGTAGG ACCGCGATCC GTAAGGCGCT CTCAAAGTTT	1437
45	TGCTGCTTCA TGAAGTGGCT TGGTCAGGAG TGCACCTGCT TCCTTCAGCC TGAGAAGGC	1497
	GCCGTGCGCG ACCAGGGTCA TGATAATGAA GCCTATGAGG GGTCCGATGT TGACCCTGCT	1557
50	GAGTCCGCCA TTAGTGACAT ATCTGGGTCC TATGTCGTCC CTGGCACTGC CCTCCAACCG	1617
	CTCTACCAGG CCCTCGATCT CCCCCTGAG ATTGTGGCTC GCGCGGGCCG GCTGACCGCC	1677
	ACAGTAAAGG TCTCCAGGT CGATGGGCGG ATCGATTGCG AGACCTTCT TGTAACAAA	1737
55	ACCTTTCGCA CGTCGTTCTG TGACGGGGCG GTCTTAGAGA CCAATGGCCC AGAGCGCCAC	1797



	AATCTCTCCT TCGATGCCAG TCAGAGCACT ATGGCCGCTG GCCCTTTCAG TCTCACCTAT	1857
5	GCCGCCCTCTG CAGCTGGGCT GGAGGTGCGC TATGTTGCTG CCGGGCTTGA CCATCGGGCG	1917
	GTTTTTGCCC CCGGTGTTT ACCCCGGTCA GCCCCGGCG AGGTTACCGC CTTCTGCTCT	1977
	GCCCTATACA GGTTTAAACG TGAGGCCAG CGCCATTGCG TGATCGGTAA CTTATGGTTC	2037
10	CATCCTGAGG GACTCATTGG CCTCTTCGCC CCGTTTTGCG CCGGGCATGT TTGGGAGTCG	2097
	GCTAATCCAT TCTGTGGCGA GAGCACACTT TACACCGTA CTTGGTCGGA GGTGTATGCC	2157
15	GTCTCTAGTC CAGCCCGGCC TGACTTAGGT TTTATGTCTG AGCCTTCTAT ACCTAGTAGG	2217
	GCCGCCACGC CTACCTGGC GGGCCCTCTA CCCCCCCTG CACCGGACCC TTCCCCCCT	2277
	CCCTCTGCCC CGGCGCTTGC TGAGCCGGCT TCTGGCGCTA CCGCCGGGGC CCCGGCCATA	2337
20	ACTACCAGA CGGCCCGCA CCGCCGCTG CTCCTCACCT ACCCGGATGG CTCTAAGGTA	2397
	TTCGCCGGCT CGCTGTTTGA GTCGACATGC ACGTGCTCG TTAACGCGTC TAATGTTGAC	2457
25	CACCGCCCTG GCGGCGGGCT TTGCCATGCA TTTTACCAA GGTACCCCGC CTCCTTTGAT	2517
	GCTGCCTCTT TTGTATGCG CGACGGCGG GCCGCTACA CACTAACCCC CCGGCCAATA	2577
	ATTCACGCTG TCGCCCTGA TTATAGGTTG GAACATAACC CAAAGAGGCT TGAGGCTGCT	2637
30	TATCGGGAAA CTTGCTCCCG CTTGCGCACC GCTGCATAAC CGCTCCTCGG GACCGGCATA	2697
	TACAGGTGCG CGATCGGCC CAGTTTTGAC GCCTGGGAGC GGAACCACCG CCCCGGGAT	2757
35	GAGTTGTACC TTCCTGAGCT TGCTGCCAGA TGGTTGAGG CCAATAGGCC GACCCGCCCG	2817
	ACTCTCACTA TAACTGAGGA TGTTGCACGG ACAGCGAATC TGGCCATCGA GCTTGACTCA	2877
	GCCACAGATG TCGGCCGGGC CTGTGCCGGC TGTCGGGTCA CCCCCGGCGT TGTTCAGTAC	2937
40	CAGTTTACTG CAGGTGTGCC TGGATCCGGC AAGTCCCGCT CTATCACCCA AGCCGATGTG	2997
	GACGTTGTGCG TGGTCCCGAC GCGTGAGTTG CGTAATGCTT GCGCCGCTCG CGGCTTTGCT	3057
45	GCTTTTACCC CGCATACTGC CGCCAGAGTC ACCCAGGGGC GCCGGGTTGT CATTGATGAG	3117
	GCTCCATCCC TCCCCCTCA CCTGCTGCTG CTCCACATGC AGCGGGCCGC CACCGTCCAC	3177
	CTTCTTGCG ACCCGAACCA GATCCAGCC ATCGACTTTG AGCACGCTGG GCTCGTCCCC	3237
50	GCCATCAGGC CCGACTTAGG CCCCACCTCC TGGTGGCATG TTACCCATCG CTGGCCTGCG	3297
	GATGTATGCG AGCTCATCCG TGGTGCATAC CCCATGATCC AGACCACTAG CCGGGTTCTC	3357
	CGTTCGTTGT TCTGGGGTGA GCCTGCCGTC GGGCAGAAAC TAGTGTTTAC CCAGGCGGCC	3417
55	AAGCCCGCCA ACCCGGGCTC AGTGACGGTC CACGAGGCGC AGGCGCTAC CTACACGGAG	3477

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	ACCACTATTA TTGCCACAGC AGATGCCCCG GGCCTTATTC AGTCGTCTCG GGCTCATGCC	3537
	ATTGTTGCTC TGACGGGCCA CACTGAGAAG TGCATCATCA TTGACGCACC AGGCCTGCTT	3597
5	CGCGAGGTGG GCATCTCCGA TGCAATCGTT AATAACTTTT TCCTCGCTGG TGGCGAAATT	3657
	GGTCACCAGC GCCCATCAGT TATTCCCCGT GGCAACCCTG ACGCCAATGT TGACACCCTG	3717
10	GCTGCCTTCC CGCCGTCTTG CCAGATTAGT GCCTTCCATC AGTTGGCTGA GGAGCTTGGC	3777
	CACAGACCTG TCCCTGTTGC AGCTGTTCTA CCACCCTGCC CCGAGCTCGA ACAGGGCCTT	3837
	CTCTACCTGC CCCAGGAGCT CACCACCTGT GATAGTGTG TAACATTGTA ATTAACAGAC	3897
15	ATTGTGCACT GCCGCATGGC CGCCCCGAGC CAGCGCAAGG CCGTGTCTGC CACACTCGTG	3957
	GGCCGCTACG GCGGTGCGAC AAAGCTCTAC AATGCTTCCC ACTCTGATGT TCGCGACTCT	4017
20	CTCGCCGTT TTATCCCGGC CATTGGCCCC GTACAGGTTA CAACTTGTGA ATTGTACGAG	4077
	CTAGTGGAGG CCATGGTCTA GAAGGGCAG GATGGCTCCG CCGTCTTGA GCTTGATCTT	4137
	TGCAACCGTG ACGTGTCCAG GATCACCCTC TTCCAGAAAG ATTGTAACAA GTTCACCACA	4197
25	GGTGAGACCA TTGCCCATGG TAAAGTGGGC CAGGCGATCT CGGCCTGGAG CAAGACCTTC	4257
	TGCGCCCTCT TTGGCCCTTG GTTCCGCGCT ATTGAGAAG CTATTCTGGC CCTGCTCCCT	4317
30	CAGGGTGTGT TTTACGGTGA TGCTTTGAT GACACCGTCT TCTCGGCGGC TGTGGCCGCA	4377
	GCAAAGGCAT CCATGGTGTT TGAGAATGAC TTTCTGAGT TTGACTCCAC CCAGAATAAC	4437
	TTTTCTCTGG GTCTAGAGTG TGCTATTATG GAGGAGTGTG GGATGCCGCA GTGGCTCATC	4497
35	CGCCTGTATC ACCTTATAAG GTCTGCGTGG ATCTTGAGG CCCCAGGA GTCTCTGCGA	4557
	GGGTTTTGGA AGAAACACTC CGGTGAGCCC GGCACCTTC TATGGAATAC TGTCTGGAAT	4617
40	ATGGCCGTTA TTACCCACTG TTATGACTTC CGCGATTTTC AGGTGGCTGC CTTTAAAGGT	4677
	GATGATTCGA TAGTGCTTTG CAGTGAGTAT CGTCAGAGT CAGGAGCTGC TGTCTGATC	4737
	GCCGGCTGTG GCTTGAAGTT GAAGGTAGAT TTCCGCCGA TCGGTTTGTA TGCAGGTGTT	4797
45	GTGGTGGCCC CCGGCCTTGG CGCGCTCCCT GATGTTGTGC GTTCGCCGG CCGGCTTACC	4857
	GAGAAGAATT GGGGCCCTGG CCCTGAGCGG GCGGAGCAGC TCGCCTCGC TGTTAGTGAT	4917
50	TTCTCCGCA AGCTCAGAA TGAGCTCAG ATGTGTGTGG ATGTTGTTTC CCGTGTAT	4977
	GGGGTTTCCC CTGGA CTGCTCATAA CTGATTGGCATGC TACAGGCTGT TGCTGATGGC	5037
	AAGGCACATT TCACTGAGTC AGTAAACCA GTGCTCGACT TGACAAATTC AATCTTGTGT	5097
55	CGGGTGAAT GA ATAACATGTC TTTTGCTGCG CCCATGGGTT CGCGACCATG	5149

	CGCCCTCGGC CTATTTTGT	GCTGCTCCTC ATGTTTTTGC CTATGCTGCC CGCGCCACCG	5209
5	CCCGGTCAGC CGTCTGGCCG	CCGTCGTGGG CGGCGCAGCG GCGGTTCCGG CGGTGGTTTC	5269
	TGGGGTGACC GGGTTGATTC	TCAGCCCTTC GCAATCCCCT ATATTCATCC AACCAACCCC	5329
	TTCGCCCCG ATGTCACCGC	TGCGGCCGGG GCTGGACCTC GTGTTGCCA ACCCGCCCGA	5389
10	CCACTCGGCT CCGCTTGGCG	TGACCAGGCC CAGCGCCCCG CCGTTGCCTC ACGTCGTAGA	5449
	CCTACCACAG CTGGGGCCGC	GCCGCTAA CCGCGGTCGC TCCGGCCCAT GACACCCCGC	5507
15	CAGTGCCTGA TGTGACTCC	CGCGGCGCCA TCTTGCGCCG GCAGTATAAC CTATCAACAT	5567
	CTCCCCTTAC CTCTTCGTG	GCCACCGGCA CTAACCTGGT TCTTTATGCC GCCCCTCTTA	5627
	GTCCGCTTTT ACCCCTTCAG	GACGGCAGCA ATACCATAT AATGGCCACG GAAGCTTCTA	5687
20	ATTATGCCA GTACCGGGT	GCCCGTGCA CAATCCGTTA CCGCCCGCTG GTCCCAATG	5747
	CTGTGCGCGG TTACGCCATC	TCCATCTCAT TCTGGCCACA GACCACCACC ACCCGACGT	5807
25	CCGTTGATAT GAATTCAATA	ACCTCGACGG ATGTTGCTAT TTAGTCCAG CCCGGCATAG	5867
	CCTCTGAGCT TGTGATCCA	AGTGAGCGCC TAACTATCG TAACCAAGGC TGGCGCTCCG	5927
	TCGAGACCTC TGGGGTGGCT	GAGGAGGAGG CTACCTCTGG TCTTGTTATG CTTTGCATAC	5987
30	ATGGCTCACT CGTAAATTC	TATACTAATA CACCTATAC CGGTGCCCTC GGGCTGTTGG	6047
	ACTTTGCCCT TGAGCTTGAG	TTTCCCAACC TTACCCCGG TAACACCAAT ACGCGGGTCT	6107
35	CCCGTTATTC CAGCACTGCT	CGCCACCGCC TTCGTCGCGG TCGGACGGG ACTGCCGAGC	6167
	TCACCACCAC GGCTGCTACC	CGCTTTATGA AGGACCTCTA TTTACTAGT ACTAATGGTG	6227
	TCGGTGAGAT CGGCCGCGG	ATAGCCCTCA CCCTGTTCAA CCTTGCTGAC ACTCTGCTTG	6287
40	GCGGCCTGCC GACAGAATTG	ATTCGTCGG CTGGTGGCCA GCTGTTCTAC TCCCGTCCCG	6347
	TTGTCTCAGC CAATGGCGAG	CCGACTGTTA AGTTGTATAC ATCTGTAGAG AATGCTCAGC	6407
45	AGGATAAGGG TATTGCAATC	CCGCATGACA TTGACCTCGG AGAATCTCGT GTGGTTATTC	6467
	AGGATTATGA TAACCAACAT	GAACAAGATC GGCCGACGCC TTCTCCAGCC CCATCGCGCC	6527
	CTTTCTCTGT CCTTCGAGCT	AATGATGTGC TTTGGCTCTC TCTACCGCT GCCGAGTATG	6587
50	ACCACTCCAC TTATGGCTCT	TCGACTGGCC CAGTTTATGT TTCTGACTCT GTGACCTTGG	6647
	TTAATGTTGC GACCGGCGCG	CAGGCCGTTG CCCGGTCGCT CGATTGGACC AAGGTCACAC	6707
	TTGACGGTCG CCCCTCTCC	ACCATCCAGC AGTACTCGAA GACCTTCTTT GTCCTGCCGC	6767
55	TCCGCGGTAA GCTCTCTTTC	TGGGAGGCAG GCACAATAA AGCCGGGTAC CCTTATAATT	6827

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ATAACACCAC TGCTAGCGAC CAACTGCTTG TCGAGAATGC CGCCGGGCAC CGGGTCGCTA	6887
TTTCCACTTA CACCACTAGC CTGGGTGCTG GTCCCGTCTC CATTTCTGCG GTTGCCGTTT	6947
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ATACTTTTGA TGATTTCTG CCAGAGTGCC GCCCCTTGG CCTTCAGGGC TGCCTTTCC	7067
AGTCTACTGT CGCTGAGCTT CAGCGCCTTA AGATGAAGGT GGGTAAACT CGGGAGTTGT	7127
AG TTTATTTGCT TGTGCCCCC TTCTTTCTGT TGCTTATTC TCATTTCTGC	7179
GTTCCGCGCT CCCTGA	7195

a fourth sequence (SEQ ID NO.10):

20  
25  
30  
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45  
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GCCATGGAGG CCCACCAGTT CATTAAGGCT CCTGGCATCA CTACTGCTAT TGAGCAAGCA	60
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GAGGTTTTTT GGAATCACCC GATTCAACGT GTTATACATA ATGAGCTTGA GCAGTATTGC	240
CGTGCTCGCT CGGGTCGCTG CCTTGAGATT GGAGCCCACC CACGCTCCAT TAATGATAAT	300
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GAAGGCTGGA ATGCCACCGA GGATGCGCTC ACTGCAGTTA TTACGGCGGC TTACCTCACA	1140
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	CTTGAACATG CTCAGAAATT TATTTACGCG CTCTACAGCT GGCTATTTGA GAAGTCAGGT	1260
	CGTGATTACA TCCCAGGCCG CCAGCTGCAG TTCTACGCTC AGTGCCGCCG CTGGTTATCT	1320
5	GCCGGGTTCC ATCTCGACCC CCGCACCTTA GTTTTTGATG AGTCAGTGCC TTGTAGCTGC	1380
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10	GAGTGTTCTT GTTTCCTCCA GCCCGCCGAG GGGCTGGCGG GCGACCAAGG TCATGACAAT	1500
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	TCATACATCG TGGATGGTCG GTCTCTGCAA ACTGTCTATC AAGCTCTCGA CCTGCCAGCT	1620
15	GACCTGGTAG CTCGCGCAGC CCGACTGTCT GCTACAGTTA CTGTTACTGA AACCTCTGGC	1680
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20	GCACGCCCTG AGGTTAACGG GCCTGAGCAG CTTAACCTCT CTTTGGACAG CCAGCAGTGT	1800
	AGTATGGCAG CCGGCCCGTT TTGCCTCACC TATGCTGCCG TAGATGGCGG GCTGGAAGTT	1860
	CATTTTTCCA CCGCTGGCCT CGAGAGCGGT GTTGTITTTCC CCCCTGGTAA TGCCCCGACT	1920
25	GCCCCGCCGA GTGAGGTCAC CGCCTTCTGC TCAGCTCTTT ATAGGCACAA CCGGCAGAGC	1980
	CAGCGCCAGT CGGTTATTGG TAGTTTGTGG CTGCACCTG AAGGTTTGCT CGGCCTGTTT	2040
30	CCGCCCTTTT CACCCGGGCA TGAGTGCGGG TCTGCTAACC CATTTTGGGG CGAGAGCACG	2100
	CTCTACACCC GCACTTGGTC CACAATTACA GACACACCTT TAACTGTCGG GCTAATTTCC	2160
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	CCCTCTGGGG CCCGTCCGGC TGGCCCAAC CCGAATGGCG TTCCGCAGCG CCGCTTACTA	2340
40	CACACCTACC CTGACGGCGC TAAGATCTAT GTCGGCTCCA TTTTCGAGTC TGAGTGCACC	2400
	TGGCTTGTC ACGCATCTAA CGCCGGCCAC CGCCCTGGTG GCGGGCTTTG TCATGCTTTT	2460
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50	GCCTATCCAC TCTTAGGCGC TGGCATTAC CAGGTGCCTG TTAGTTTGAG TTTTGATGCC	2700
	TGGGAGCGGA ACCACCGCCC GTTTGACGAG CTTTACCTAA CAGAGCTGGC GGCTCGGTGG	2760
	TTTGAATCCA ACCGCCCCGG TCAGCCACG TTGAACATAA CTGAGGATAC CGCCCGTGCG	2820
55	GCCAACCTGG CCCTGGAGCT TGACTCCGGG AGTGAAGTAG GCCGCGCATG TGCCGGGTGT	2880

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5	AACGCTTGGC GCGCCCGGG CTTTGC6GCA TTTACTCCGC AACTGCGGC CCGTGTCACT	3060
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10	CATATGCAGC GTGCTGCATC TGTGCACCTC CTTGGGGACC CGAATCAGAT CCCC6CCATA	3180
	GATTTTGAGC ACACCGGTCT GATTCCAGCA ATACGGCCGG AGTTGGTCCC GACTTCATGG	3240
	TGGCATGTCA CCCACCGTTG CCCTGCAGAT GTCTGTGAGT TAGTCCGTGG TGCTTACCCT	3300
15	AAAATCCAGA CTACAAGTAA GGTGTCCGT TCCCTTTTCT GGGGAGAGCC AGTGTCGGC	3360
	CAGAAGCTAG TGTTACACA GGCTGCTAAG GCCGCGCACC CCGGATCTAT AACGGTCCAT	3420
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	GTTATACTTG ACTCTCCCGG CCTGTTGCGT GAGGTGGGTA TCTCAGATGC CATTGTTAAT	3600
25	AATTTCTTCC TTTCGGGTGG CGAGGTTGGT CACCAGAGAC CATCGGTCAT TCCGCGAGGC	3660
	AACCCTGACC GCAATGTTGA CGTGCTGCG GCGTTTCCAG CTTTCATGCCA AATAAGCGCC	3720
30	TTCCATCAGC TTGCTGAGGA GCTGGGCCAC CGGCCGGCGC CGGTGGCGGC TGTGCTACCT	3780
	CCCTGCCCTG AGCTTGAGCA GGGCCTTCTC TATCTGCCAC AGGAGCTAGC CTCCTGTGAC	3840
	AGTGTGTGTA CATTTGAGCT AACTGACATT GTGCACTGCC GCATGGCGGC CCCTAGCCAA	3900
35	AGGAAAGCTG TTTTGTCCAC GCTGGTAGGC CGGTATGGCA GACGCACAAG GCTTTATGAT	3960
	GCGGGTCACA CCGATGTCCG CGCCTCCCTT GCGCGCTTTA TTCCCACTCT CGGGCGGGTT	4020
40	ACTGCCACCA CCTGTGAACT CTTTGAGCTT GTAGAGGCGA TGGTGGAGAA GGGCCAAGAC	4080
	GGTTCAGCCG TCCTCGAGTT GGATTTGTGC AGCCGAGATG TCTCCCGCAT AACCTTTTTC	4140
	CAGAAGGATT GTAACAAGTT CACGACCGGC GAGACAATTG CGCATGGCAA AGTCGGTCAG	4200
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50	TCAGTATTCT CTGCTGCCGT GGCTGGCGCC AGCCATGCCA TGGTGTGTTGA AAATGATTTT	4380
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55	CTGCAGGCCC CAAAAGAGTC TTTGAGAGGG TTCTGGAAGA AGCATTCTGG TGAGCCGGGC	4560

	AGCTTGCTCT GGAATACGGT GTGGAACATG GCAATCATTG CCCATTGCTA TGAGTTCCGG	4620
	GACCTCCAGG TTGCCGCCTT CAAGGGCGAC GACTCGGTCG TCCTCTGTAG TGAATACCGC	4680
5	CAGAGCCCAG GCGCCGGTTC GCTTATAGCA GGCTGTGGTT TGAAGTTGAA GGCTGACTTC	4740
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	GTCGTTGAT TCGCCGGACG GCTTTCGGAG AAGAACTGGG GGCCTGATCC GGAGCGGGCA	4860
10	GAGCAGCTCC GCCTCGCCGT GCAGGATTTC CTCCGTAGGT TAACGAATGT GGCCAGATT	4920
	TGTGTTGAGG TGGTGTCTAG AGTTTACGGG GTTTCGCCGG GTCTGGTTCA TAACCTGATA	4980
15	GGCATGCTCC AGACTATTGG TGATGGTAAG GCGCATTTTA CAGAGTCTGT TAAGCCTATA	5040
	CTTGACCTTA CACACTCAAT TATGCACCGG TCTGAATGAA TAACATGTGG TTTGCTGCGC	5100
	CCATGGGTTG GCCACCATGC GCCCTAGGCC TCTTTTGCTG TTGTTCTCT TGTTCCTGCC	5160
20	TATGTTGCCC GCGCCACCGA CCGGTCAGCC GTCTGGCCGC CGTCGTGGGC GGCGCAGCGG	5220
	CGGTACCGGC GGTGGTTTCT GGGGTGACCG GGTGATTCT CAGCCCTTCG CAATCCCTA	5280
25	TATTCATCCA ACCAACCCTT TTGCCCCAGA CGTTGCCGCT GCGTCCGGGT CTGGACCTCG	5340
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	CGCTGCCTCC CGTCGCCGAC CTGCCACAGC CGGGGCTGCG GCGGTGACGG CTGTGGCGCC	5460
30	TGCCCATGAC ACCTCACCCG TCCCGGACGT TGATTCTCG GGTGCAATTC TACGCCGCA	5520
	GTATAATTG TCTACTCAC CCGTGACATC CTCTGTGGCC TGTGGCACTA ATTTAGTCT	5580
35	GTATGCAGCC CCCCTTAATC CGCCTCTGCC GCTGCAGGAC GGTACTAATA CTCACATTAT	5640
	GGCCACAGAG GCCTCCAATT ATGCAGTA CCGGGTTGCC CGCGTACTA TCCGTTACCG	5700
	GCCCCTAGTG CCTAATGCAG TTGGAGGCTA TGCTATATCC ATTTCTTTCT GGCCCTCAAC	5760
40	AACCACAACC CCTACATCTG TTGACATGAA TTCCATTACT TCACTGATG TCAGGATTCT	5820
	TGTTCAACCT GGCATAGCAT CTGAATTGGT CATCCAAGC GAGCGCCTTC ACTACCGCAA	5880
45	TCAAGGTTGG CGCTCGGTTG AGACATCTGG TGTGCTGAG GAGGAAGCCA CCTCCGGTCT	5940
	TGTCATGTTA TGCATACATG GCTCTCCAGT TAACTCTAT ACCAATACCC CTTATACCGG	6000
	TGCCCTTGGC TTA CTGACT TTGCCCTAGA GCTTGAGTTT CGCAATCTCA CCACCTGTAA	6060
50	CACCAATACA CGTGTGTCCC GTTACTCCAG CACTGCTCGT CACTCCGCCC GAGGGGCCGA	6120
	CGGGACTGCG GAGCTGACCA CAACTGCAGC CACCAGGTTG ATGAAAGATC TCACTTTAC	6180
55	CGGCCCTAAT GGGGTAGGTG AAGTCGGCCG CGGGATAGCT CTAACATTAC TTAACCTTGC	6240

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	TTATTCCC GC CGGTGTCT CAGCCAATGG CGAGCCAACC GTGAAGCTCT ATACATCAGT	6360
5	GGAGAATGCT CAGCAGGATA AGGGTGTTGC TATCCCCCAC GATATCGATC TTGGTGATTC	6420
	GCGTGTGGTC ATTCAAGGATT ATGACAACCA GCATGAGCAG GATCGGCCA CCCCGTCGCC	6480
	TGCGCCATCT CGGCCTTTTT CTGTTCTCCG AGCAAATGAT GTACTTTGGC TGTCCTCAC	6540
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	CAGCGTGACT TTGGTGAATG TTGCGACTGG CGCGCAGGCC GTAGCCCGAT CGCTTGACTG	6660
15	GTCCAAAGTC ACCCTCGACG GCGGGCCCT CCCGACTGTT GAGCAATATT CCAAGACATT	6720
	CTTTGTGCTC CCCCTTCGTG GCAAGCTCTC CTTTGGGAG GCCGGCACAA CAAAAGCAGG	6780
	TTATCCTTAT AATTATAATA CTACTGCTAG TGACCAGATT CTGATTGAAA ATGCTGCCGG	6840
20	CCATCGGGTC GCCATTTC AA CCTATACAC CAGGCTTGGG GCCGGTCCGG TCGCCATTC	6900
	TGCGGCCGCG GTTTTGGCTC CACGCTCCG CCTGGCTCTG CTGGAGGATA CTTTGTATTA	6960
25	TCCGGGGCGG GCGCACACAT TTGATGACTT CTGCCCTGAA TGCCGCGCTT TAGGCCTCCA	7020
	GGGTTGTGCT TTCCAGTCAA CTGTCCTGA GGTCCAGCGC CTAAAGTTA AGGTGGGTAA	7080
	AAC TCGGGAG TTGTAGTTTA TTTGGCTGTG CCCACCTACT TATATCTGCT GATTTCCTT	7140
30	ATTTCCTTT TCTCGGTCCC GCGCTCCCTG A	7171
	<b>or a fifth sequence (SEQ ID NO.12) :</b>	
	CGGGCCCCGT ACAGGTCACA ACCTGTGAGT TGTACGAGCT AGTGGAGGCC ATGGTCGAGA	60
35	AAGGCCAGGA TGGCTCCGCC GTCCTTGAGC TCGATCTCTG CAACCGTGAC GTGTCCAGGA	120
	TCACCTTTTT CCAGAAAGAT TGCAATAAGT TCACCACGGG AGAGACCATG GCCCATGGTA	180
40	AAGTGGGCCA GGGCATTTCG GCCTGGAGTA AGACCTTCTG TGCCCTTTTC GGCCCTGGT	240
	TCCGTGCTAT TGAGAAGGCT ATTCTGGCCC TGCTCCCTCA GGGTGTGTTT TATGGGGATG	300
	CCTTTGATGA CACCGTCTTC TCGGCGCGTG TGGCCGAGC AAAGGCGTCC ATGGTGTGTTG	360
45	AGAATGACTT TTCTGAGTTT GACTCCACCC AGAATAATTT TTCCTGGGC CTAGAGTGTG	420
	CTATTATGGA GAAGTGTGGG ATGCCGAAGT GGCTCATCCG CTTGTACCAC CTTATAAGGT	480
50	CTGCGTGGAT CTGCAAGGCC CCGAAGGAGT CCCTGCGAGG GTGTTGGAAG AAACACTCCG	540
	GTGAGCCCGG CACTCTTCTA TGAATACTG TCTGGAACAT GGCCGTTATC ACCCATTTGT	600
	ACGATTTCG CGATTTCAG GTGGCTGCCT TTAAAGGTGA TGATTGATA GTGCTTTGCA	660
55	GTGAGTACCG TCAGAGTCCA GGGGCTGCTG TCCTGATTGC TGGCTGTGGC TTAAAGCTGA	720



AGGTGGGTTT CCGTCCGATT GGTTTGTATG CAGGTGTTGT GGTGACCCCC GGCCTTGGCG 780  
 CGCTTCCGA CGTCGTGCGC TTGTCCGGCC GGCTTACTGA GAAGAATTGG GGCCCTGGCC 840  
 CTGAGCGGGC GGAGCAGCTC CGCCTTGCTG TGCG 874

or a sequence complementary thereto.

10 14. A kit comprising, in a container or separate  
 containers, a pair of single-strand primers derived  
 from nonhomologous regions of opposite strands of a  
 DNA duplex fragment derived from an enterically  
 transmitted viral hepatitis agent whose genome  
 15 contains a region which is homologous to the 1.33 kb  
 DNA EcoRI insert present in plasmid pTZKF1(ET1.1)  
 carried in E. coli strain BB4 and having ATCC deposit  
 no. 67717.

20 15. The kit of claim 15, which are derived from  
 opposite strands of the EcoRI duplex insert in said  
 plasmid.

25 16. A method for detecting the presence of an  
 enterically transmitted nonA/nonB hepatitis viral  
 agent in a biological sample, comprising  
 preparing a mixture of duplex DNA fragments  
 derived from the sample,

denaturing the duplex fragments,  
 30 adding to the denatured DNA fragments, a pair of  
 single-strand primers derived from nonhomologous  
 regions of opposite strands of a DNA duplex fragment  
 derived from an enterically transmitted viral  
 hepatitis agent whose genome contains a region which  
 35 is homologous to the 1.33 kb DNA EcoRI insert present  
 in plasmid pTZKF1(ET1.1) carried in E. coli strain  
 BB4, and having ATCC deposit no. 67717,

hybridizing said primers to homologous-sequence  
 region of opposite strands of such duplex DNA

fragments derived from enterically transmitted nonA/nonB hepatitis agent,

reacting the primed fragment strands with DNA polymerase in the presence of DNA nucleotides, to form new DNA duplexes containing the primer sequences, and repeating said denaturing, adding, hybridizing and reacting steps, until a desired degree of amplification of sequences is achieved.

17. The method of claim 16, wherein the primers are derived from opposite strands of the EcoRI duplex insert in said plasmid.

18. The method of claim 16, for detecting the presence of viral agent in a sample of cultured cells infected with the agent.

19. A vaccine for immunizing an individual against enterically transmitted nonA/nonB hepatitis viral agent comprising, in a pharmacologically acceptable adjuvant, a recombinant protein derived from an enterically transmitted nonA/nonB viral hepatitis agent whose genome contains a region which is homologous to the 1.33 kb DNA EcoRI insert present in plasmid pTZ-RF1(ET1.1) carried in E. coli strain BB4, and having ATCC deposit no. 67717.

20. The vaccine of claim 19, wherein the protein is derived from the EcoRI insert in said plasmid.

21. A vaccine for immunizing an individual against HEV comprising, in a pharmacologically acceptable adjuvant, a protein encoded by genetic sequence 406.3-2 or 406.4-2 or a fragment thereof.

22. In a method of isolating an enterically transmitted nonA/nonB viral agent or a nucleic acid fragment produced by the agent, an improvement which

comprises: utilizing, as a source of said agent, bile obtained from a human or cynomolgus monkey having an active infection of enterically transmitted non-A/non-B hepatitis.

5

23. The method of claim 22, wherein the bile is obtained from an infected cynomolgus monkey.

10

24. Human polyclonal anti-serum obtained from a human immunized with a protein derived from an enterically transmitted non-A/non-B viral hepatitis agent whose genome contains a region which is homologous to the 1.33 kb DNA EcoRI insert present in plasmid pTZKF1(ET1.1) carried in E. coli strain BB4 and having ATCC deposit no. 67717.

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ADD  
A17